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RESURGENCE OF HEPATITIS A IN HOMOSEXUAL MEN IN MONTREAL CENTRE, QUEBEC

Epidemiologic Pattern:

Between 1 November 1994 and 31 December 1995, 261 cases of hepatitis A virus (HAV) were reported to the *Direction de la santé publique (DSP) de la région de Montréal-Centre*. Serologic confirmation of 257 cases was obtained through detection of the HAV IgM antibody. The incidence rate was 12.6 cases per 100,000 person years, representing a 200% increase over a rate of 4.2 cases per 100,000 person years during the preceding 14 months. Incidence in the male population, particularly in the 20-to 39-year-old age group, rose from 10.8 cases to 42.4 cases per 100,000 person years (Figure 1). The average age was 31.2 years (range: 3 to 72 years). Over three-quarters (78.5%) of these cases were male. The cases were concentrated in the downtown Montreal area.

Data on exposure and risk factors were obtained for 85% of cases reported over the past 3 years. The number of cases where the main risk factor was sexual relations between men increased significantly in 1995. The number of cases related to other risk factors, such as travel to countries where HAV is endemic, remained relatively stable (Figure 2).

In 1994 and 1995, 13% of reported cases required hospitalization. The median hospital stay was 5 days (range: 1 to 28 days). Although no deaths have been reported to date, a hepatologist reported three severe cases presenting transient hepatic failure in homosexual men. The incidence of acute hepatitis B did not increase over this period.

Intervention:

An HAV working group of the *DSP* in Montreal Centre was established in early January 1995 to monitor the epidemiologic situation and propose an intervention strategy.

Information letters on the epidemiologic situation and a reminder of control measures were sent to general practitioners, microbiologist-infectious disease specialists, gastroenterologists, hepatologists, pediatricians, and heads of hospital emergency rooms in the Montreal area. Physicians were asked to quickly report any suspected cases of HAV (for example, jaundice with negative HBsAg) and to offer HAV vaccine at a cost to male homosexual patients. An article on HAV carrying the same message was published in a medical weekly with a large circulation. Public health workers in other regions of Quebec were also informed of the situation by e-mail.

A news release was sent to gay newspapers. *DSP* produced and printed close to 2,500 information pamphlets explicitly describing the mode of HAV transmission and means of prevention, including immunization. A community organization involved in AIDS prevention in the male homosexual population distributed the pamphlets in gay bars, baths, and movie theatres.

Epidemiologic follow-up was carried out on all reported cases to obtain more information on risk factors and on the application of preventive measures in close-contact situations.

Comments:

Although HAV has a low mortality rate and few sequelae, it is easily transmissible with significant morbidity[1]. The present epidemiologic pattern in Montreal suggests continuous HAV transmission from person to person, especially within the male homosexual community in downtown Montreal. Other than two small outbreaks in child-care facilities (four cases) and in a number of closely related families (five cases), no major outbreak has occurred outside the gay community, despite the fact that at least 4% of these cases work as food handlers or bartenders.

A number of other cases involving gay men have been reported in other regions of Quebec. In Montreal, no direct link has been

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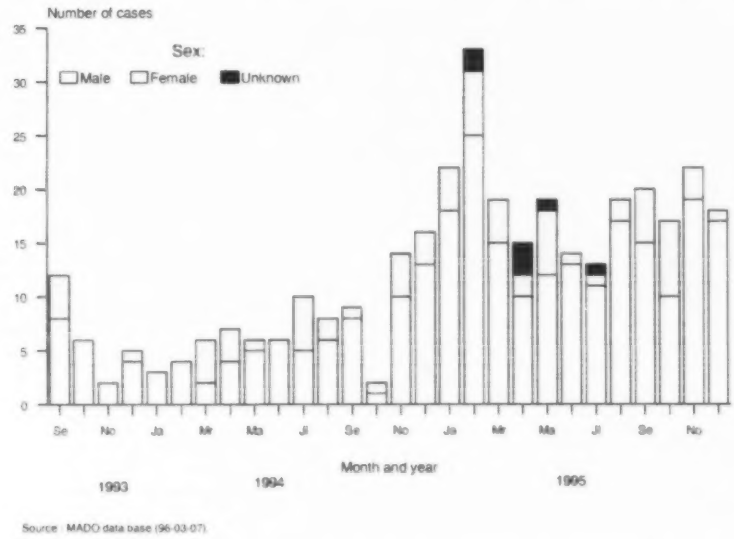
established with the outbreaks that occurred among homosexual men in Halifax in 1994 (K. MacIsaac, Department of Health, Halifax: personal communication, 1996) or in Boston, where some 30 cases of hepatitis A have been reported since the summer of 1995 (Dr. A. Berry, Department of Health and Hospital, Boston: personal communication, 1996).

From 1990 to 1992, a hepatitis A epidemic in the Montreal region also affected gay men living in the downtown area[2,3]. Incidence rose at that time to almost 70 cases per 100,000 person years in men (compared to < 10 cases per 100,000 person years in women) at the height of the epidemic. Despite the high attack rate in 1992, this epidemic evidently did not significantly reduce the number of susceptible individuals in the gay community. In this open, mobile population, an influx of individuals would allow for the continued circulation of the virus. However, neither the seroprevalence data needed to estimate the percentage of susceptible individuals nor the means of predicting the development of the current epidemic were available.

Controlling such an epidemic in an open community is a challenge. Crucial factors in prevention and control are quick diagnosis, early reporting of cases and prompt administration of immunoprophylaxis to close contacts. Despite the information sent to physicians, delays in reporting cases averaged 21 days. Some reports contained no identifying data, so *DSP* staff had to contact attending physicians for further information. Moreover, many close contacts did not receive the immune globulin (IG) at the right time. In addition, an IG shortage occurred for a number of weeks in the winter of 1995, after the Miles Company decided to take all lots of IG for intramuscular administration off the market to screen them for hepatitis C virus RNA. Lots that subsequently became available were initially concentrated in two clinics and set aside on a priority basis for contacts of HAV cases.

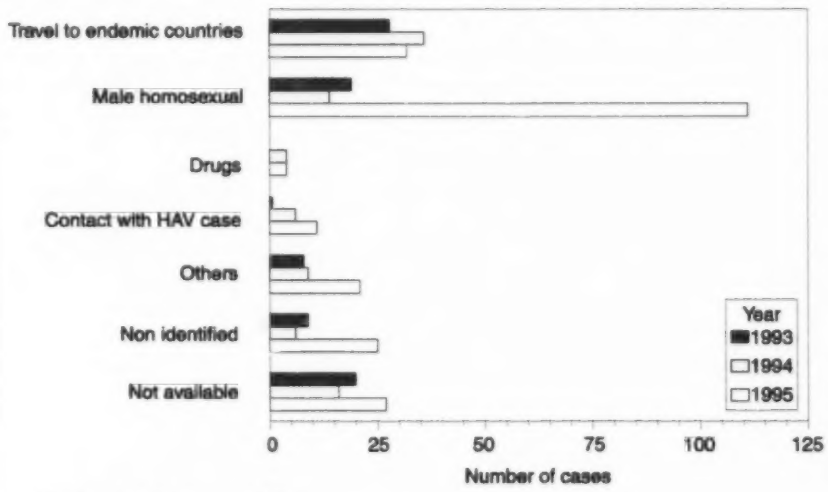
So far, the *DSP* control strategy has consisted essentially of disseminating information designed to raise the gay community's awareness of the problem and the means of prevention. A survey of homosexual men conducted in Toronto following an information campaign at the time of an HAV outbreak from 1991 to

Figure 1
Number of hepatitis A cases by month of receipt of report and sex, Montreal Centre, September 1993 to December 1995



Source: MADO data base (96-03-07).

Figure 2
Distribution of hepatitis A cases by main risk factor, * Montreal Centre, 1993–1995



* 2 to 7 weeks before the onset of illness.
Source: Public Health Unit, Montreal Centre, (96-03-07).

early 1992 showed that almost nine out of 10 respondents were aware of the outbreak and that many of them were practising safer sex. Two thirds of the respondents had seen an advertisement in a gay newspaper and half had seen the poster produced by the Department of Public Health[4]. In Montreal, the impact of distributing information to the gay community has not been evaluated. The news release appeared only once in four newspapers and was not very noticeable. There was initial enthusiasm for the pamphlet, but subsequently it stayed on the display rack.

An HAV vaccine is now available, and consideration must be given to using it to control epidemics in open communities. A single dose of vaccine has proven effective in ending outbreaks in certain communities (unpublished observations, Alaska Native Medical Center, Division of Public Health, State of Alaska). Obstacles to implementing such a measure under present conditions include the difficulty of identifying and reaching the target population, the mobility of the population, and the high cost of the vaccine.

Consultations among physicians who have a large male homosexual clientele and gay community groups have taken place over the past months. Thanks to the collaboration of the *Ministère de la Santé et des Services sociaux, Centres locaux de services communautaires*, and many doctors and community organization, *DSP* was able to launch an immunization campaign starting 31 July 1996. Over the next few months, a first dose of hepatitis A vaccine (1,440 units/ mL) is being offered free to homosexual and bisexual men living in the Montreal area.

Acknowledgements:

We wish to thank Dr. B. Turmel and Dr. G. Lonergan (members of the HAV working group), the nurses and doctors of the *DSP* who participated in the survey, and L. Marcotte for providing computer assistance, Montreal; R. Lavoie and P. Deslandres, Séro Zéro; K. MacIsaac, Department of Health, Halifax; Dr. A. Berry, Department of Health and Hospital, Boston, Mass.; Dr. M. Lavoie, resident in community medicine, University of Montreal; Dr. M.-C. Racine, resident in family medicine, University of Montreal; Dr. B. Willems and all the members of the Hepatology Department, *Hôpital St-Luc*, Montreal; Dr. M. Steben, contributor to *Actualité médicale*, and the physicians, laboratories and nurses who reported cases.

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Source: *L Valiquette, MD, MSc, R Dion, MD, L Bédard, MPH, MScN, DSP de Montréal-Centre, Montreal, Quebec.*

Editorial Comment

As noted at the end of the above report, a single dose of HAV vaccine is being used in an effort to reduce transmission of the disease, in addition to IG and health promotion efforts. While there is some unpublished and published evidence that HAV vaccine is useful in controlling outbreaks in well-defined communities[1,2], an evaluation of its use in an urban setting is not available. The epidemiology of hepatitis A in Montreal is relatively well described and, therefore, it will be possible to follow disease incidence after the immunization program is underway. However, as described in the previous report from Montreal[3], incidence of disease is probably cyclical, which would make interpretation of trends difficult. It will also be of interest to measure the uptake of a second dose of vaccine (not being provided free of charge), which may be necessary to maintain the expected benefits of the initial dose.

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ISOLATION OF *BORRELIA BURGDORFERI* — THUNDER BAY DISTRICT, ONTARIO

The Lyme disease (LD) spirochete, *Borrelia burgdorferi*, has been isolated from a black-legged tick, *Ixodes scapularis* (northern populations formerly considered *I. dammini*). This is the first time that a live culture of *B. burgdorferi* has been isolated in the Thunder Bay District.

The tick was removed from the rump of a dog in Thunder Bay, Ontario on 31 October 1995. The dog had never travelled outside the city. During the 2to 3-week period prior to the removal of the tick, the dog had a cough.

The live tick was forwarded to the Vector-borne Diseases Laboratory, British Columbia Centre for Disease Control (BCCDC), Vancouver, British Columbia for spirochetal analysis. It was positively identified as *I. scapularis*.

Prior to dissection, the fully engorged female tick was surfacesterilized in the laboratory using 10% hydrogen peroxide, followed by 70% isopropyl alcohol. The midgut contents were surgically removed, placed in BSK II culture medium, and incubated at 35° C. Cultures were checked weekly using dark-field

microscopy. Within 2 weeks, characteristic motile spirochetes of *B. burgdorferi* were seen.

Polymerase chain reacting (PCR) identified the genes of OspA, 16S rRNA, and HSP60 of *B. burgdorferi* in the isolate. The OspA [31 kilodaltons (kDa)], OspB (34 kDa), OspC (22-25 kDa), P39 (39 kDa), flagellin (41 kDa), HSP60 (60 kDa), and 66 kDa bands were profiled using sodium dodecyl sulfate-polyacrylamide gel electrophoresis. The isolate was further analyzed for plasmid profile; pulsed-field gel electrophoresis (PFGE) separation of macrorestriction digests (*Mlu*I and *Sma*I) of total DNA was also carried out. A 135 kbp PFGE band, characteristic of *B. burgdorferi* sensu stricto, was detected in the restriction digest. The isolate also reacted with monoclonal antibodies to Osps A-D, Fla, BmpA (P39), GroEL, DNAk, P22, and P93[1]. Based on the above observations and tests on this isolate, the spirochete is confirmed to be the *B. burgdorferi* sensu stricto.

Blood, drawn from the dog 7 days after the tick was removed, tested negative to the antibodies of *B. burgdorferi* at a private laboratory (Diagnostic Veterinary Systems, Don Mills, Ontario). At 21 and 35 days, more blood samples were drawn and sent to the BCCDC. By this time, the dog had seroconverted and both samples were positive with immunofluorescent assay readings of 1:512 and 1:256, respectively. Using Western blot, the latter two blood sera were positive for antigens for OspA-C, P39, flagellin, HSP60, and 66 kDa band.

On 24 November 1994, a fully engorged *I. scapularis* female was removed from a cat in Thunder Bay. This cat had never left the city. PCR testing was used to determine the presence of *B. burgdorferi* in this dead tick[2]. Although the cat was destroyed before testing for LD, clinical signs indicated possible infection. It had a skin rash (7 cm X 7 cm) at the site of the tick bite on the back of its neck and suffered from lameness, pruritus, renal and bowel dysfunction, and had become very aggressive towards its owner.

Up to the end of 1995, 98 locations/occurrences across Ontario have been documented where the black-legged tick has been found with no history of significant travel by the hosts. Eighteen of these were reports of the tick on dogs, cats, birds, and humans in the Thunder Bay District. The first specimen was collected in 1982 from a human[3].

Based on the adult ticks collected from hosts in this area, early questing activity occurs mid-May to mid-July, with fall questing in October and November. Between 1992 and 1995, six adults were collected in the spring and early summer, which is indicative of overwintering. Total annual snowfall in the Thunder Bay area averages 196 cm and apparently provides a suitable microclimate at the soil surface for *I. scapularis*. The beneficial effect of snowcover was clearly seen in the winter of 1995-96 when the mean air temperature for the period from 19 December to 31 March was -13.9° C (max. + 1.3° C, min. -33.7° C), while the mean temperature at ground level beneath the snow was -0.9° C (max. -0.4° C, min. -2.5° C) (S. Forrester, Department of Biology, Lakehead University: personal communication, 1996). Further studies are needed to determine if all three developmental stages are overwintering in the Thunder Bay area.

Endemic areas in Minnesota and Wisconsin provide a source for the black-legged tick, a primary vector of LD. Migratory birds then transport *I. scapularis* into the Thunder Bay region of Ontario. In the spring of 1995, *I. scapularis* larvae were removed from an American robin (*Turdus migratorius*) and a chipping sparrow (*Spizella passerina*) during bird banding at Thunder Cape on Sibley peninsula[4]. Some ground-frequenting birds and birds carrying immature (larvae or nymphs) ticks act as competent reservoirs for *B. burgdorferi*.

Between 1984 and the end of 1995, a total of 14 LD cases were reported in the Thunder Bay District. Nine had no history of travel. In the same period, a total of 228 cases were reported for all of Ontario (C. LeBer, Public Health Branch, Ontario Ministry of Health: personal communication, 1996).

B. burgdorferi has been discovered in individual *I. scapularis* from several Ontario locations including Kenora[5], Keewatin, Rainy River, and Point Pelee[2]. As well, it has been found in a beaver tick (*I. banksi*) at Sault Ste. Marie and a squirrel tick (*I. marxi*) at Palmer Rapids, Renfrew County[2]. More research is needed to determine if *I. banksi* and *I. marxi* are competent vectors capable of transmitting LD spirochetes to animals and humans.

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Source: *S Banerjee, PhD, M Banerjee, PhD, Vector-borne Diseases Laboratory, BCCDC, Vancouver, British Columbia; J Scott, BSc(Agr), President, Lyme Disease Association of Ontario, Fergus, M Lankester, PhD, Department of Biology, Lakehead University, Thunder Bay, J Kubinec, DVM, Fort William Animal Clinic, Thunder Bay, Ontario.*

Editorial Comment

The US Centers for Disease Control and Prevention (CDC) received reports of 11,603 cases of LD from 43 states and the District of Columbia in 1995 (overall incidence 4.4 per 100,000 population), the second highest annual number reported since 1982 but an 11% decrease from the 13,043 cases reported in 1994[1]. As in previous years, the highest numbers of cases were reported from the northeastern, north-central, and mid-Atlantic regions.

Personal protection measures (e.g., applying tick repellants and inspecting for ticks) and environmental modifications (e.g., applying insecticides and using deer fencing) will continue to be important methods for reducing the risk of exposure to tick bites and preventing LD and other tickborne diseases (e.g., ehrlichiosis and babesiosis). Human granulocytic ehrlichiosis (HGE) was first described in 1994[2] among patients in Minnesota and Wisconsin. It is caused by an agent closely related to *Ehrlichia equi*. The HGE

agent has been identified in the deer (*I. scapularis*) and dog (*Dermacentor variabilis*) ticks[2].

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Notifiable Diseases Summary

We have excluded this table from the FAX issue of Canada Communicable Disease Report for those readers who do not need this information. For those readers interested in this table, call the FAX line and select the index to get the access number.

Notifiable Diseases Summaries published to date in this new format (FAX) can be found in the index under the same name.

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First Quarter (1st) (1 January - 31 March 1996) - Premier Trimestre (1er) (1 janvier - 31 mars 1996)

Disease Maladie	ICD-9 CIM-9	Ontario			Manitoba			Saskatchewan			Alberta			British Columbia Colombie-Britannique			Yukon			Northwest Territories Territoires du Nord-ouest		
		1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95
AIDS-Sida	042-044	..	..	123	..	..	3	..	..	7	..	..	26	..	..	44	..	..	..	..	..	1
Amoebiasis - Amibiase	006	103	103	228	9	9	12	6	6	9	14	14	17	105	105	75	1	1	1	..	..	..
Botulism - Botulisme	005.1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Brucellosis - Brucellose	023	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Campylobacteriosis - Campylobacteriose	008.41*	581	581	1152	41	41	38	41	41	32	146	146	204	409	409	584	2	2	2	6	6	3
Chancroid - Chancre mou	099.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chickenpox - Varicelle	052	..	..	..	..	..	..	..	..	..	1425	1425	2904	..	..	..	35	35	25	113	113	380
Chlamydia, genital - Chlamydiose génitale	099.81*	1952	1952	3134	601	601	767	624	624	408	876	876	1424	..	..	..	31	31	34	241	241	248
Cholera - Choléra	001	1	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria - Diphtérie	032	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Giardiasis - Giardiase	007.1	356	356	570	..	..	..	91	91	51	88	88	144	305	305	317	7	7	8	8	8	10
Gonococcal infections - Infections gonococciques[7]	098	429	429	684	129	129	188	107	107	95	50	50	115	152	152	149	9	9	1	26	26	38
Gonococcal Ophthalmia neonatorum - Ophtalmie gonococcique du nouveau-né	098.4	..	..	4	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..
Haemophilus influenzae B (all invasive) - (invasive) à H. influenzae B[7]	320.0.038.41*	5	5	7	..	..	1	..	..	..	2	2	2	..	..	..	..	..	..	1	1	1
Hepatitis A - Hépatite A	070.0.070.1	53	53	100	101	101	106	36	36	52	44	44	43	184	184	72	..	..	..	1	1	..
Hepatitis B - Hépatite B	070.2.070.3	17	17	89	5	5	..	30	30	4	19	19	29	393	393	429	..	..	..	..	..	1
Hepatitis C - Hépatite C		1273	1273	1253	..	..	..	270	270	113	..	..	..	1592	1592	984	11	11	11	6	6	6
Hepatitis non-A, non-B - Hépatite non-A, non-B		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Legionellosis - Legionellose	482.41	6	6	9	..	..	..	1	1	1	..	..	2	..	..	..	..	..	..	..	..	..
Leprosy - Lèpre	030	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..
Listeriosis (all types) - Listériose (tous genres)	027.0.771.22*	2	2	3	..	..	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Malaria - Paludisme	084	26	26	28	1	1	3	..	..	..	1	1	..	14	14	17	1	1	1	..	..	..
Measles - Rougeole	055	102	102	64	..	..	..	2	2	2	..	..	..	9	9	3	2	2	..	..	..	..
Meningitis, pneumococcal - Méningite à pneumocoques	320.1	..	..	..	..	..	1	1	1	4	2	2	2	1	1	7	..	..	..	..	..	..
Meningitis, other bacterial - Autres méningites bactériennes[1,4]		15	15	23	..	..	..	2	2	1	7	7	4	..	..	..	..	..	..	..	..	2
Meningitis/Encephalitis viral - Méningite/encéphalite virale[4]		1	1	1	..	..	4	1	1	5	11	11	3	3	3	2	..	..	..	..	..	1
Meningococcal infections - Infections à méningocoques	036	32	32	30	2	2	1	1	1	2	7	7	3	..	..	7	..	..	..	1	1	..
Mumps - Oreillons	072	28	28	49	2	2	6	3	3	2	14	14	21	13	13	9	3	3	1	..	..	..
Paratyphoid - Paratyphoïde	002.1-002.9	1	1	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pertussis - Coqueluche	033	83	83	666	39	39	252	108	108	25	228	228	176	130	130	71	36	36	7	6	6	2
Plague - Peste	020	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Poliomyelitis - Poliomyélite	045	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rabies - Rage	071	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rubella - Rubéole	056	7	7	153	..	..	1	..	..	..	6	6	7	6	6	6	..	..	..	..	..	..
Congenital Rubella - Rubéole congénitale	771.0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salmonellosis - Salmonellose[8]	003	286	286	496	42	42	30	63	63	25	143	143	118	223	223	129	2	2	2	3	3	3
Shigellosis - Shigellose	004	41	41	105	14	14	17	27	27	21	13	13	23	..	..	47	..	..	1	..	..	..
Syphilis, Congenital - Syphilis, congénitale	090	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Syphilis, Early Latent - Syphilis latente récente	092	3	3	9	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Syphilis Early, Symptomatic - Symptomatique, recente	091	6	6	20	..	..	..	1	1	6	..	..	3	5	5	9	..	..	..	..	..	..
Other Syphilis - Autres syphilis	090.092-097	17	17	83	..	..	3	..	..	..	8	8	9	..	..	..	..	..	..	..	..	..
Tetanus - Tétanos	037	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trichinosis - Trichinose	124	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tuberculosis - Tuberculose	010-018	42	42	230	..	..	..	..	..	..	..	..	..	61	61	54	..	..	1	17	17	5
Typhoid - Typhoïde	002.0	1	1	11	1	1	..	..	..	..	1	1	6	..	..	..	..	..	..	..	..	..
Verotoxigenic E. coli - E. coli vérotoxinogènes	008.01*	26	26	73	8	8	4	7	7	2	16	16	10	..	..	..	..	..	..	..	..	..
Yellow Fever - Fièvre jaune	060	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

SYMBOLS

. Not reportable
.. Not available
_ No cases reported

SIGNES

. À déclaration non obligatoire
.. Non disponible
_ Aucun cas déclarés

SOURCE:
Division of Dissease Surveillance
Laboratory Centre for Disease Control
Health Canada
Ottawa, Ontario K1A 0L2
Tel.: (613) 957-0334

SOURCE:
Division de la surveillance des maladies transmissibles
Laboratoire de lutte contre la maladie
Santé Canada
Ottawa (Ontario) K1A 0L2
Tél.: (613) 957-0334

HEALTH CANADA - SANTÉ CANADA

Notifiable Diseases Summary - Sommaire des maladies à déclaration obligatoire

New Cases Reported for First Quarter (1st) (1 January - 31 March 1996) - Nouveaux cas déclarés pour le premier trimestre (1er) (1 janvier - 31 mars 1996)

Disease Maladie	ICD-9 CIM-9	Canada[1]			Newfoundland Terre-Neuve			Prince Edward Island Île-du-Prince-Édouard			Nova Scotia Nouvelle-Écosse			New Brunswick Nouveau-Brunswick			Quebec Québec		
		1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95	1st 1er	Cum. 96	Cum. 95
AIDS-Sida	042-044	–	–	287	–	–	1	–	–	–	–	–	5	–	–	2	–	–	75
Amoebiasis - Amibiase	006	297	297	398	1	1	2	–	–	1	5	5	3	–	–	–	53	53	50
Botulism - Botulisme	005.1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Brucellosis - Brucellose	023	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Campylobacteriosis - Campylobactériose	008.41*	1752	1752	2562	11	11	15	4	4	11	39	39	36	3	3	33	469	469	452
Chancroid - Chancre mou	099.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chickenpox - Varicelle	052	1883	1883	3600	302	302	79	–	–	–	8	8	208	–	–	1	–	–	–
Chlamydia, genital - Chlamydiose génitale	099.81*	6155	6155	8593	85	85	92	24	24	29	281	281	318	29	29	172	1411	1411	1967
Cholera - Choléra	001	1	1	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Diphtheria - Diphtérie	032	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Giardiasis - Giardiase	007.1	1069	1069	1342	10	10	11	4	4	–	17	17	33	7	7	20	176	176	178
Gonococcal infections - Infections gonococciques	098	1012	1012	1474	–	–	2	–	–	–	8	8	13	1	1	1	101	101	188
Gonococcal Ophthalmia neonatorum - Ophtalmie gonococcique du nouveau-né	098.4	–	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Haemophilus influenzae B (all invasive) - (invasive) à H. influenzae B[2]	320.0.038.41*	14	14	16	1	1	1	–	–	–	–	–	–	–	–	1	5	5	3
Hepatitis A - Hépatite A	070.0.070.1	564	564	529	–	–	–	–	–	–	1	1	5	–	–	1	144	144	150
Hepatitis B - Hépatite B	070.2.070.3	729	729	790	1	1	–	1	1	–	12	12	17	–	–	10	251	251	211
Hepatitis C - Hépatite C		3160	3160	2397	3	3	10	–	–	–	–	–	–	5	5	20	–	–	–
Hepatitis non-A, non-B - Hépatite non-A, non-B		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Legionellosis - Légionellose	482.41	8	8	20	–	–	–	–	–	–	1	1	2	–	–	–	–	–	6
Leprosy - Lèpre	030	2	2	4	–	–	–	–	–	–	–	–	1	–	–	–	2	2	1
Listeriosis (all types) - Listériose (tous genres)	027.0.771.22*	2	2	7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Malaria - Paludisme	084	66	66	75	–	–	–	–	–	–	–	–	–	–	–	–	23	23	26
Measles - Rougeole	055	119	119	75	–	–	–	–	–	–	–	–	–	–	–	1	4	4	5
Meningitis, pneumococcal - Méningite à pneumocoques	320.1	4	4	17	–	–	1	–	–	–	–	–	–	–	–	2	–	–	–
Meningitis, other bacterial - Autres méningites bactériennes[3,4]		28	28	33	4	4	–	–	–	–	–	–	2	–	–	1	–	–	–
Meningitis/Encephalitis viral - Méningite/encéphalite virale[5]		17	17	19	–	–	–	–	–	1	–	–	–	1	1	–	–	–	2
Meningococcal infections - Infections à méningocoques	036	61	61	79	1	1	–	–	–	–	1	1	2	–	–	1	16	16	33
Mumps - Oreillons	072	82	82	106	–	–	–	–	–	–	2	2	2	–	–	1	17	17	15
Paratyphoid - Paratyphoïde	002.1-002.9	2	2	3	–	–	–	–	–	–	–	–	–	–	–	–	1	1	1
Pertussis - Coqueluche	033	1112	1112	2610	26	26	37	11	11	1	94	94	89	9	9	48	342	342	1236
Plague - Peste	020	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Poliomyelitis - Poliomyélite	045	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rabies - Rage	071	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rubella - Rubéole	056	28	28	186	–	–	–	–	–	–	–	–	–	–	–	–	9	9	19
Congenital Rubella - Rubéole congénitale	771.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Salmonellosis - Salmonellose[6]	003	1127	1127	1130	6	6	18	1	1	8	19	19	26	3	3	30	336	336	245
Shigellosis - Shigellose	004	163	163	320	1	1	–	–	–	–	–	–	2	–	–	2	67	67	102
Syphilis, Congenital - Syphilis, congénitale	090	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Syphilis, Early Latent - Syphilis, latente récente	092	5	5	14	–	–	–	–	–	–	–	–	–	–	–	3	1	1	2
Syphilis: Early, Symptomatic - Symptomatique, récente	091	14	14	39	–	–	–	–	–	–	2	2	1	–	–	–	–	–	–
Other Syphilis - Autres syphilis	090.092-097	37	37	116	–	–	–	–	–	–	1	1	3	1	1	2	10	10	16
Tetanus - Tétanos	037	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–
Trichinosis - Trichinose	124	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tuberculosis - Tuberculose	010-018	175	175	379	6	6	2	–	–	–	–	–	–	–	–	–	49	49	87
Typhoid - Typhoïde	002.0	5	5	28	–	–	–	–	–	–	–	–	–	–	–	–	2	2	11
Verotoxigenic E. coli - E. coli vérotoxinogènes	008.01*	99	99	138	1	1	1	–	–	–	10	10	–	–	–	1	31	31	47
Yellow Fever - Fièvre jaune	060	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–